A Marshall Cavendish Collection

EVERY FORTNIGHT

QUEST

ADVENTURES IN THE WORLD OF SCIENCE

LEISURE

31

THREE PROJECTS

MAKE THE DIVE BOMBER

FACT FILES ON:

- The ultimate roller-coaster
- Space Camp
- Inside modern zoos
- The video Walkman
- Monster movies
- Radio-controlled models
- Computer adventure games

GIANT POSTER

QUEST DATABASE FOR THE AMSTRAD CPC 464

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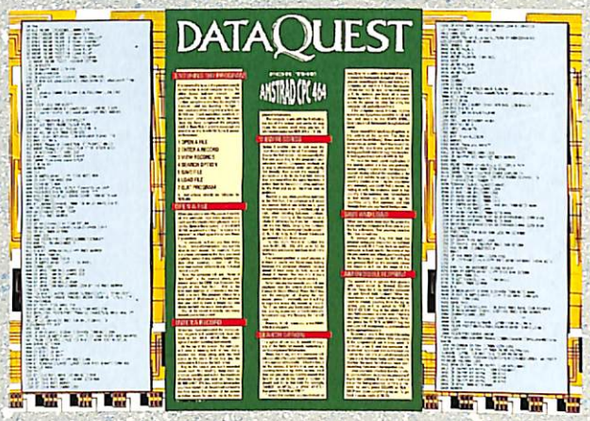
FULLY SOR

INSIDE THIS PACK

FACT FILES

▶ 'White-knuckle' rides ▶ Movie special-effects secrets ▶ 'Battle simulators' ▶ The hi-tech stadium ▶ Animal conservation

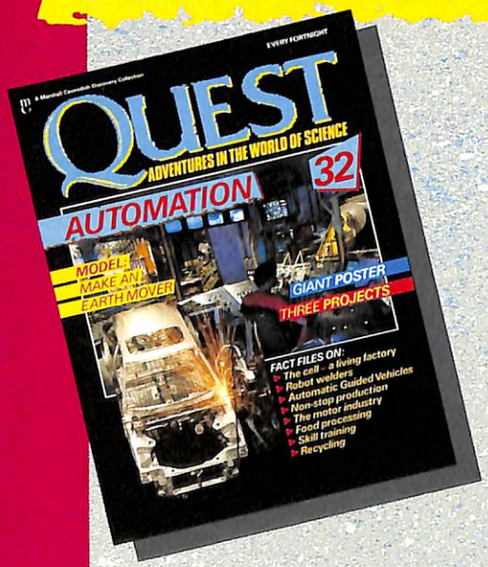
MODEL The Dive Bomber



POSTER
Quest Database for the Amstrad CPC 464

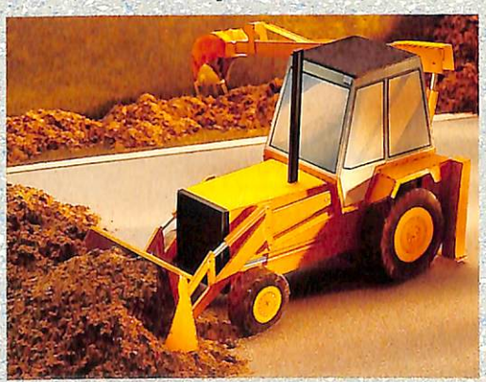
THREE SCIENTIFIC PROJECTS

COMING IN QUEST 32 AUTOMATION

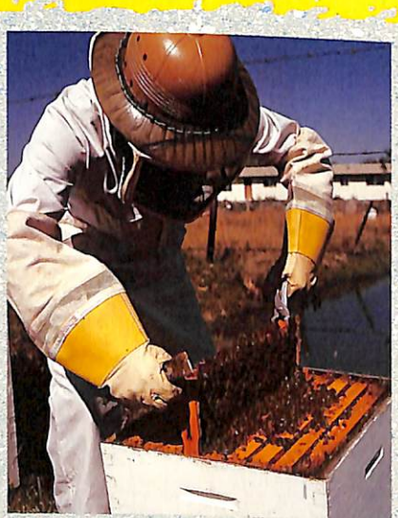


FACT FILES INCLUDE:

▶ Blast furnaces
▶ Food processing
▶ Robot workers
▶ The human cell
▶ Recycling waste
▶ Assembly lines



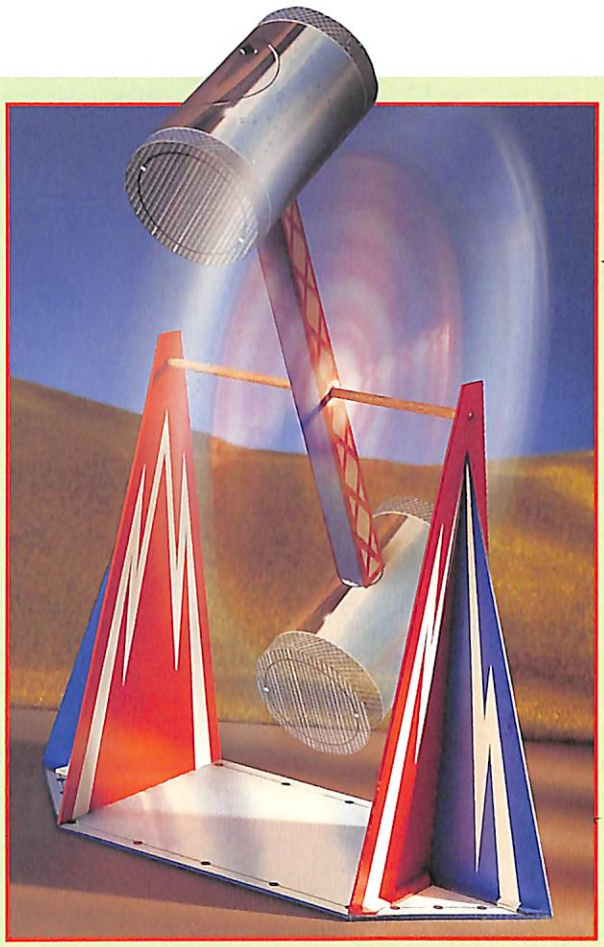
MODEL
JCB Digger



POSTER
The bee factory

ISSN 1350-3766

MODEL
ASSEMBLY INSTRUCTIONS



DIVE BOMBER

You will need
Scissors • Ruler • Craft knife • Glue • Plastic drinking straw

Before cutting out the pieces, score along all broken lines with a blunt edge and ruler to make folding and gluing easier. Study the ASSEMBLY DIAGRAM to see how the pieces fit together, and use dotted lines as a guide for positioning.
NB Younger children will need supervision when using a craft knife.

To make up
Support structure
1 Cut out base **A** and supports **B** and **C**. Cut slits at areas marked with a cross on **B** and **C**. Fold and glue tabs **B** and **C**. Affix tabs **B** and **C** to positioning markers at each end of base **A** (see ASSEMBLY DIAGRAM).
2 Cut out wings **D** and **E**. Fold and glue tabs of **D** and attach long-edged tab to markers in centre of **B** and short-edged tab to base **A**. Fold and glue tabs of **E** and affix long-edged tab to marker in centre of **C** and short-edged tab to base **A**.
Arm
1 Cut out arm **F**. Using craft knife cut slits at cross marks. Fold arm **F** into rectangular tube (see ASSEMBLY DIAGRAM).
Capsule One
1 Cut out **G** and using craft knife cut slits to form tabs. Do not fold tabs. Fold **G** to form a tube and glue.
2 Cut out capsule inner support **H** and using craft knife cut out the two circles. Fold into a rectangle and glue tab.
3 Cut out capsule **I**. Using craft knife cut out circle. Fold tab and glue into cylinder shape (See ASSEMBLY DIAGRAM).
4 Spread glue on the two solid sides of capsule inner support **H**. Place inside capsule **I** ensuring the holes line up. Align glued edges of **H** with positioning markers on side of capsule **I**.
5 Push the tabbed end of **G** through the holes of capsule **I** and both holes of capsule inner support **H**. Fold tabs of **G** outwards to lock it in position.
6 Cut out disc **J** and glue in position over tabs **G** (see Fig 1).
7 Glue end of **G** and insert into **F** up to the positioning marker.
8 Glue discs **K** and **L** to either end of **I**.
Capsule two
1 Cut out **M** and using craft knife cut slits to form tabs. Do not fold tabs. Fold **M** to form a tube and glue.
2 Cut out capsule inner support **N** and using craft knife cut out the two circles. Fold into a rectangle and glue tab.
3 Cut out capsule **O**. Using craft knife cut out circle. Fold tab and glue into cylinder shape (see ASSEMBLY DIAGRAM).
4 Spread glue on the two solid sides of capsule inner support **N**. Place inside capsule **O** ensuring the holes line up. Align glued edges of **N** with positioning markers on sides of capsule **O**.
5 Push tabbed end of **M** through the holes of capsule **O** and both holes of capsule inner support **N**. Fold tabs of **M** outwards to lock it in position.
6 Cut out disc **P** and glue in position over tabs **M** (see Fig 1).
7 Glue end of **M** and insert into **F** up to positioning marker.
8 Glue discs **Q** and **R** to either end of capsule **O**.
Spinning wheel
1 Insert plastic drinking straw through slits in supports **B** and **C** and arm **F** (see ASSEMBLY DIAGRAM).

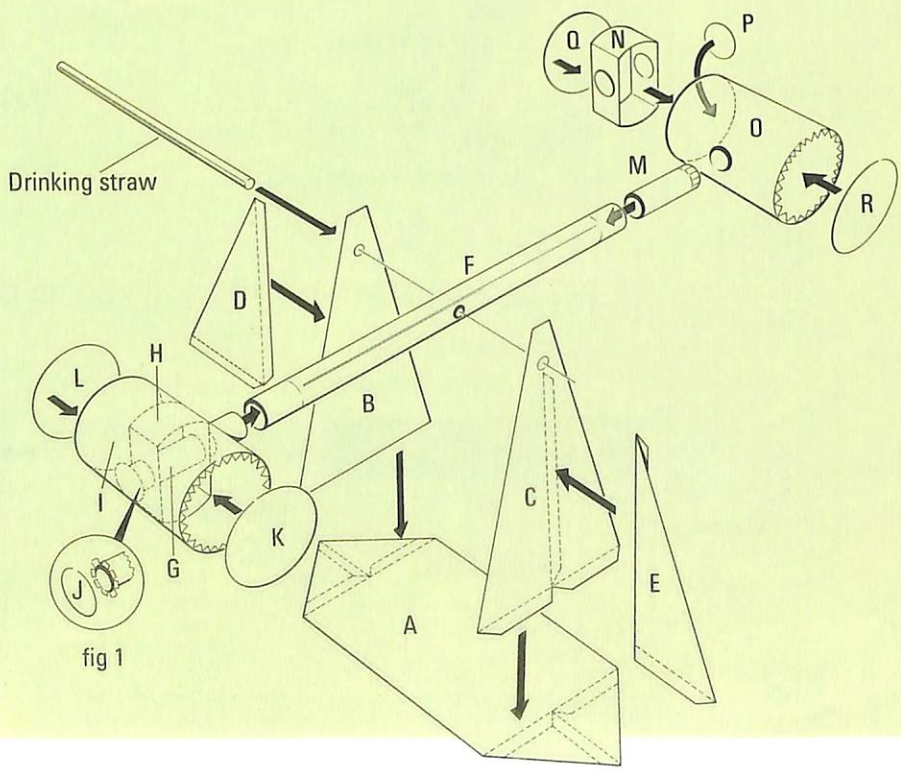


fig 1

PROJECTS

LEISURE

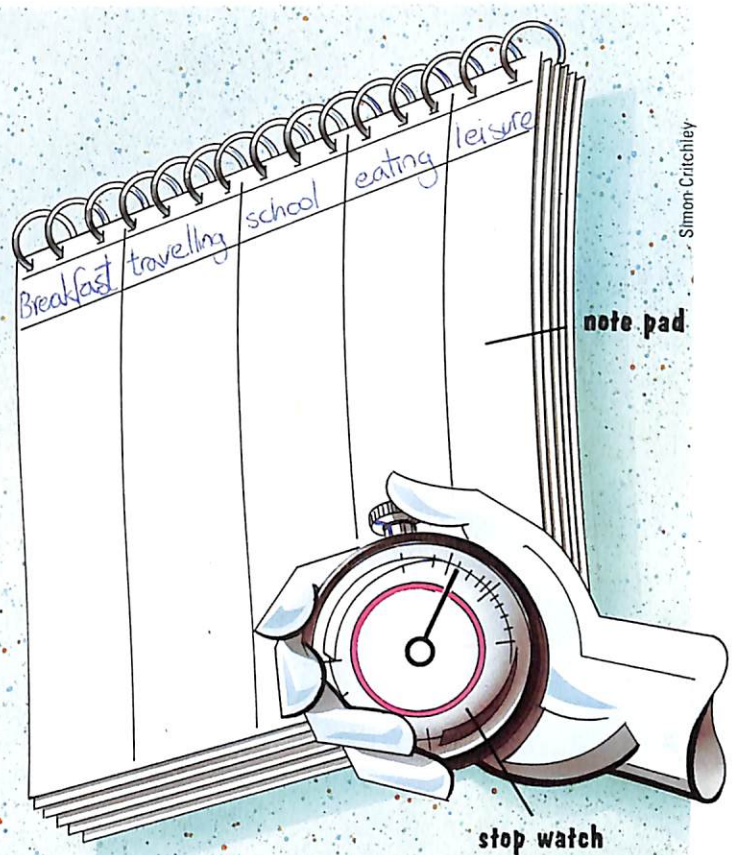
- Calculate how much of your total time is spent in leisure.

MAKE A LEISURE LOG

1 2 3 4 5

Making a log of your daily movements is a simple form of time-and-motion study.

All you need to perform this time-and-motion study of your own movements is a notepad, pen and a stopwatch or a watch with a second hand. To make it simple, define your occupations into 'breakfast/preparation', travelling', 'school', 'eating' and 'leisure'. Take a typical school day and make a note of the time that you wake up. Make a note again just as you're leaving for school – this is the start of your 'travelling time'. Note when you arrive at school. Continue like this throughout the day until you go to bed. You now have a complete log of your typical school day. Ask friends to do this and compare the results.



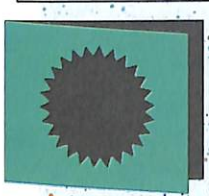
Simon Critchley

$$\frac{\text{time}}{24} \times 100 = \text{percentage}$$

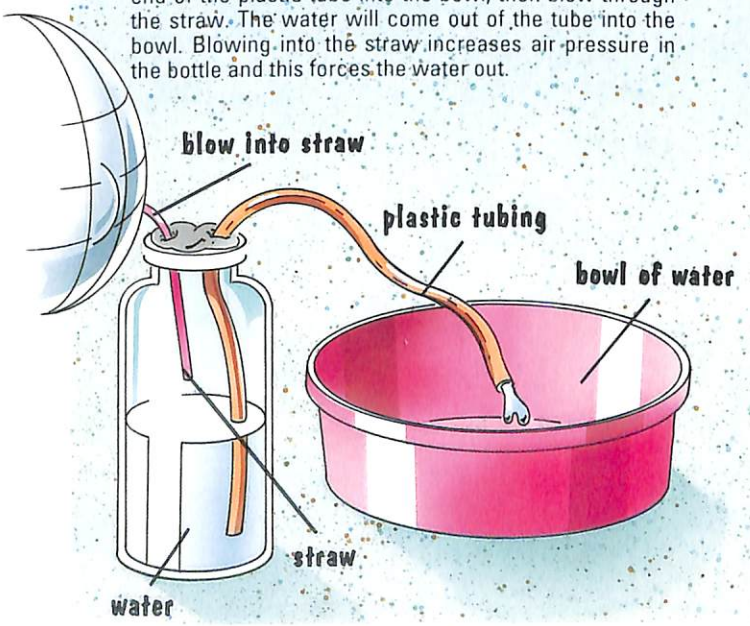
ADVENTURES IN THE WORLD OF SCIENCE

MAKE A PRESSURE PUMP

1 2 3 4 5



You will need a small bottle, a milk bottle is ideal, a straw, a piece of plastic tubing, some plasticine and a large glass or plastic bowl. First half fill the bottle with water. Place the plastic tube in the bottle so that its end touches the bottom. Mould the plasticine around it, then push the straw through it as shown. Make sure that the plasticine seals all the gaps. Put the end of the plastic tube into the bowl, then blow through the straw. The water will come out of the tube into the bowl. Blowing into the straw increases air pressure in the bottle and this forces the water out.



MAKE AN EGG PLIABLE

1 2 3 4 5

Half fill a small bowl with malt vinegar and place an egg (in its shell) in it so that the egg is submerged. When the egg floats to the surface turn it over so that the other side is in the vinegar. Leave it for a week. When you take the egg out you will find that it has become soft. After a while it will go back to its normal shape.

PROJECT INFORMATION

1 2 3 4 5

*Each **QUEST** project has its own difficulty rating: 1 very simple, 2 simple, 3 intermediate, 4 advanced, 5 complicated.*

WARNING!

Parents should ensure that experiments involving sharp tools, water and electricity are supervised. The publisher can accept no responsibility for injury.

QUEST

THE

CPC 464

s with the first field at
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ch time you key in
RETURN or ENTER.

RDS

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d – not necessarily the
o the program's own
mputers' methods of
al order vary slightly.
elect the records in
the first field. If more
the same first letter, it
econd letter, and then
on. But there can be

n you have numbers
omputer will select
letter but it goes
g method, digit by
tween numbers,
he numbers as a
you fed in records
rrying the numbers
uter would select 1,
17, 18 and 19 before it
and so on.
is is to number the
0, ..011, up to 100. Or
g numbers at all in the

m arises if you use a
d lower case letters,
ter chooses capitals
. So 'ABC' would be
ou may find it more
ything in capitals.
records, you will see
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enu). Press the F key,
will display the next
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backwards through
n run backwards and
file using the F and B

urn you to the MAIN

TION

ou to **search** through
records containing a
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u want to **search**. Key
elds – 1 for the first, 2
the third and so on,
of the screen. It will
u want to **search** that
e word or number it
at field. For example,
, or GREAT WHITE –
ENTER.
er you key in must be

exactly what is written in the field. If a word is stored in the records in capital letters and you are searching for it in small letters, the computer will not find it. Even the spaces left between words must correspond exactly. If, by mistake, you have left a space before the entry in the record, or accidentally hit the space bar after the entry, the computer will probably not find it.

If the computer cannot find any records with the word you have asked for, it will tell you and return to the MAIN MENU. Otherwise it will list records in alphabetical order.

Every record has two lines of options at the bottom of the screen. The first is F(orward) B(ack) M(enu). These work in the same way as before – the F key advancing through the records one by one, the B key taking you backwards through the records, M taking you direct to the MAIN MENU.

Perhaps the most useful application of the **search** option is to find one particular record using only one word. For example, if you are storing a list of the countries of the world, and had the following fields set up: country, capital, area in sq km, population and currency, you could find a record by keying in only the currency used in that country. If the currency was not exclusive to that record you could call up the countries using that currency and flick through them until you found the right one.

SAVE AND LOAD

When you want to **save** your file, press the 5 key and the computer will ask you to give the file a filename. Then you may save the file in the normal way.

To consult your files, first **load** the program using your machine's normal **load** routine and RUN it. Press the 6 key and the computer will ask you for the name of the file you want to see. When you have keyed in the filename, pressed the RETURN key and pressed PLAY on the cassette player, the machine will load the required file.

AMEND/DELETE/PRINT

The second line of options that appears with each record is A(mend) D(elete) P(rint). Press the A key and the computer will ask 'Which field number?' When you have keyed in the number of the field you want to amend, counting from the top as before, you will be asked to 'ENTER MODIFICATION'. Key in the whole of the new field you want to enter, even if there is only one letter you want to amend. When you press the RETURN or ENTER key, the computer will incorporate your amendment in the appropriate place.

To delete a record, first locate it by using the **search** or **view** options. After you press D, the computer will ask 'Are you sure?' To continue, press Y, and the computer will delete that record and display the next one – either the next one picked alphabetically if you are in the **view** mode, or the next one that has the same field that you have been searching if you are in the **search** mode.

Once you have checked that the printer is connected and switched on, press the P key to start printing. If you press P without the printer being attached, or if the printer does not work, press ESCAPE or RUN / STOP and come out of the program. To get back in again, key in GOTO 20.

```
1030 IF OP=5 THEN DF=0: MD=2: GOSUB 1650: IF DF=V OR
LEFT$(A$(1), 1)="" THEN RETURN
1040 GOTO 970
1060 INPUT "Enter file name□□"; Q$: IF LEN(Q$)<1 OR
LEN(Q$)>255 THEN GOTO 1060
1070 OPENOUT Q$
1080 WRITE #9, R, A
1090 FOR N=1 TO A
1100 WRITE #9, N$(N), G(N), B(N)
1110 NEXT
1120 WRITE #9, B(N)
1130 FOR M=1 TO R
1140 WRITE #9, A$(M)
1150 NEXT
1160 CLOSEOUT
1170 RETURN
1190 IF R>0 THEN ERASE N$, G, B, A$, D$
1191 INPUT "Enter file name□□"; X$: IF LEN(X$)<1 OR LEN(X$)>8
THEN GOTO 1190
1200 OPENIN X$
1210 INPUT #9, R, A: DIM N$(A): DIM G(A): DIM B(A+1)
1220 FOR N=1 TO A
1230 INPUT #9, N$(N), G(N), B(N)
1240 NEXT
1250 INPUT #9, B(N): DIM A$(R)
1260 FOR M=1 TO R
1270 INPUT #9, A$(M)
1280 NEXT
1290 DIM D$(A): CLOSEIN
1300 RETURN
1320 PRINT "Are you sure?"
1330 R$=INKEY$
1340 IF R$="" THEN GOTO 1330
1350 IF R$<>"Y" AND R$<>"y" THEN RETURN
1360 END
1380 PRINT "AMEND which field (1 TO□"; A; ")?"
1390 INPUT J: IF J>A THEN GOTO 1380
1440 INPUT "Enter modified field now"; D$(J)
1445 IF LEN (D$(J))<G(J) THEN FOR M=LEN(D$(J))+1 TO
G(J): D$(J)=D$(J)+" ": NEXT M
1450 MID$(A$(D), B(J)+1, G(J))=D$(J)
1490 IF D=R THEN J=-1: GOTO 1560
1500 IF D=1 THEN J=1: GOTO 1540
1510 IF A$(D)>A$(D+1) THEN J=1
1520 IF A$(D)<A$(D-1) THEN J=-1
1540 IF LEFT$(A$(D+1), 1)="" AND J=1 THEN GOTO 1630
1560 IF J=1 THEN GOTO 1600
1570 IF A$(D)>=A$(D-1) THEN GOTO 1630
1580 X$=A$(D): A$(D)=A$(D-1): A$(D-1)=X$: D=D-1: GOTO 1490
1600 IF A$(D)<=A$(D+1) THEN GOTO 1630
1610 X$=A$(D): A$(D)=A$(D+1): A$(D+1)=X$: D=D+1: GOTO 1490
1630 CLS: RETURN
1650 PRINT "ARE YOU SURE YOU WISH TO DELETE?"
1660 R$=INKEY$
1670 IF R$="" THEN GOTO 1660
1680 IF R$<>"Y" AND R$<>"y" THEN CLS: RETURN
1690 CLS: PRINT "□□DELETING□□"
1700 DD=D
1720 IF D=R THEN DD=DD-1: GOTO 1750
1730 IF LEFT$(A$(D+1), 1)<>"" THEN A$(D)=A$(D+1): D=D+1: GOTO
1720
1750 FOR F=1 TO 2000: NEXT F: CLS: A$(D)=""
1760 D=DD: IF LEFT$(A$(1), 1)="" THEN D=0: RETURN
1770 IF D=0 THEN D=1
1780 IF LEFT$(A$(D), 1)="" THEN D=D-1
1790 IF MD=1 THEN RETURN
1800 K=1
1820 IF MID$(A$(K), B(Z)+1, G(Z))=Z$ THEN GOTO 1860
1830 IF K=R OR LEFT$(A$(K), 1)="" THEN DF=1: GOTO 870
1840 K=K+1: GOTO 1820
1860 DD=D: PA=1
1880 IF LEFT$(A$(DD), 1)="" OR DD=0 THEN PA=2: DD=D: MO=MO-1
1890 IF MID$(A$(DD), B(Z)+1, G(Z))=Z$ THEN D=DD: RETURN
1900 DD=DD+MO: GOTO 1880
1920 CLS
1930 PRINT "Record number□"; D; "□□": FOR N=1 TO A
1940 PRINT: PRINT N$(N); TAB(12); MID$(A$(D), B(N)+1, G(N))
1950 NEXT
1960 PRINT: PRINT: PRINT: PRINT
"□F(orward)□□B(ack)□□□□M(enu)□□□□□A(mend)□□□□D(elete)□□P(rin
ter)□"
1980 V$=INKEY$: IF V$="" THEN GOTO 1980
1990 IF V$="P" OR V$="p" THEN PRINT #8, "Record
number□"; D; "□□": FOR N=1 TO A: PRINT #8: PRINT
#8, N$(N); TAB(25); MID$(A$(D), B(N)+1, G(N)): NEXT: PRINT #8: PRINT
#8: PRINT #8: GOTO 1980
2000 OP=0: IF V$="F" OR V$="f" THEN OP=1: MO=1
2010 IF V$="B" OR V$="b" THEN OP=2: MO=-1
2020 IF V$="M" OR V$="m" THEN OP=3
2030 IF V$="A" OR V$="a" THEN OP=4
2040 IF V$="D" OR V$="d" THEN OP=5
2050 IF OP=0 THEN GOTO 1980
2060 RETURN
```

Mark Franklin

```
10 R=0
20 CLS: PRINT "□M□A□I□N□□□M□E□N□U□"
30 PRINT: PRINT: PRINT "1: -Open a file"
40 PRINT: PRINT: PRINT "2: -Enter a record"
50 PRINT: PRINT: PRINT "3: -View records"
60 PRINT: PRINT: PRINT "4: -Search option"
70 PRINT: PRINT: PRINT "5: -Save file"
80 PRINT: PRINT: PRINT "6: -Load file"
90 PRINT: PRINT: PRINT "7: -Quit program"
100 PRINT: PRINT: PRINT "-SELECT OPTION-"
120 I$=INKEY$
130 IF I$="" THEN GOTO 120
140 choice=VAL(I$)
150 IF choice>7 OR choice<1 THEN GOTO 120
160 IF R=0 AND choice<>1 AND choice<>6 AND choice<>7 THEN
GOTO 120
170 CLS
180 ON choice GOSUB 210, 400, 610, 750, 1060, 1190, 1320
190 GOTO 30
210 CLS
220 PRINT "ARE YOU SURE?"
225 confirm$=INKEY$: IF confirm$="" THEN GOTO 225
230 IF confirm$<>"Y" AND confirm$<>"y" THEN RETURN
240 CLS
250 PRINT "□CREATE A NEW FILE□"
260 IF R>0 THEN ERASE N$, G, B, A$, D$
270 INPUT "Number of fields (1-8)□"; A
280 IF A<1 OR A>8 THEN GOTO 270
290 DIM D$(A): DIM N$(A): DIM G(A): DIM B(A+1): T=0
300 FOR N=1 TO A
310 PRINT "Name of field□"; N; "□?□": INPUT N$(N)
330 PRINT "Length of field□"; N; "□?□": INPUT G(N)
340 IF G(N)>50 THEN GOTO 330
350 B(N)=T: T=T+G(N): NEXT: B(N)=T
360 INPUT "How many records"; R
370 DIM A$(R)
380 RETURN
400 C=1
420 IF LEFT$(A$(C), 1)="" THEN GOTO 460
430 IF C=R THEN GOTO 580
440 C=C+1: GOTO 420
460 PRINT C-1; "□out of□"; R; "□records in use"
470 PRINT: FOR N=1 TO A: PRINT N$(N); "?"
480 INPUT D$(N): IF LEN(D$(N))>G(N) THEN GOTO 480
481 PRINT D$(N)
485 IF LEN(D$(N))<G(N) THEN FOR M=LEN(D$(N))+1 TO
G(N): D$(N)=D$(N)+"□": NEXT
490 A$(C)=A$(C)+D$(N): NEXT
500 IF C=1 THEN RETURN
510 N=C
530 IF A$(C)>=A$(C-1) THEN RETURN
540 X$=A$(C): A$(C)=A$(C-1): A$(C-1)=X$: C=C-1
550 IF C=1 THEN RETURN
560 GOTO 530
580 CLS: PRINT: PRINT "□F□I□L□E□□□F□U□L□L□"
585 FOR F=1 TO 2000: NEXT F
590 RETURN
610 D=1: IF LEFT$(A$(1), 1)="" THEN RETURN
630 IF D=0 THEN D=1
640 IF D-1=R THEN D=D-1
650 IF LEFT$(A$(D), 1)="" THEN D=D-1
670 GOSUB 1920
680 IF OP=1 THEN D=D+1: GOTO 630
690 IF OP=2 THEN D=D-1: GOTO 630
700 IF OP=3 THEN RETURN
710 IF OP=4 THEN GOSUB 1380
720 IF OP=5 THEN MD=1: GOSUB 1650: IF D=0 THEN RETURN
730 GOTO 670
750 FOR N=1 TO A: PRINT: PRINT N; TAB(11); ": - "; N$(N): NEXT
760 PRINT: PRINT: PRINT "SEARCH WHICH FIELD (1 TO□"; A; ")?"
770 Y$=INKEY$
780 IF Y$="" THEN GOTO 770
800 IF VAL(Y$)<1 OR VAL(Y$)>A THEN GOTO 770
810 Z=VAL(Y$): PRINT: PRINT "Search field□"; Z; "□for what ?"
820 INPUT Z$
821 IF LEN(Z$)<G(Z) THEN FOR M=LEN(Z$)+1 TO
G(Z): Z$=Z$+"□": NEXT
830 CLS: K=1
850 IF MID$(A$(K), B(Z)+1, G(Z))=Z$ THEN GOTO 900
870 IF K=R OR LEFT$(A$(K), 1)="" THEN CLS: PRINT "□NO RECORDS
WITH□"; Z$; "□IN FIELD□"; Z: FOR F=1 TO 4000: NEXT F: RETURN
880 K=K+1: GOTO 850
900 D=1: PM=1: MO=1
920 IF D>R THEN D=PM
930 IF D=0 THEN D=PM
940 IF LEFT$(A$(D), 1)="" THEN D=PM
950 IF MID$(A$(D), B(Z)+1, G(Z))<>Z$ THEN D=D+MO: GOTO 920
970 GOSUB 1920
980 PM=D
990 IF OP=1 THEN MO=1: D=D+MO: GOTO 920
1000 IF OP=2 THEN MO=-1: D=D+MO: GOTO 920
1010 IF OP=3 THEN RETURN
1020 IF OP=4 THEN GOSUB 1380
```

DATA

FOR

AMSTRAD

ENTERING THE PROGRAM

It is essential to type in the program exactly as instructed to avoid computer errors. The white boxes indicate spaces – not graphics. Be sure to enter the exact number using the space key. You might find it easier – and less daunting – to type in short sections of the program at a time, say 20-30 lines. Check each block carefully on the screen before going on to the next. Once you have completed the program, SAVE it. Then RUN it and the seven options available on the MAIN MENU will appear on the screen:

1 OPEN A FILE
2 ENTER A RECORD
3 VIEW RECORDS
4 SEARCH OPTION
5 SAVE FILE
6 LOAD FILE
7 QUIT PROGRAM

All instructions should be followed by RETURN.

OPEN A FILE

When you open a new file, you will need to tell the computer how many records you want, and the maximum length each record can be. **Open a file** *is option 1 on the MAIN MENU, so press the 1 key. The words 'Are you sure?' will flash up on the screen. Press Y to continue.*

The computer will ask you how many 'fields' – items of information – you want to store in each record. For example, if you are a keen astronomer, the field you need might be: name of star, position, brightness, date when observed – four in all. The maximum number of fields in any individual record is eight.

Next, the computer will ask, 'Name of first field?' In the example above, your answer would be STAR. It will then ask the length of the first field – that is, the maximum number of characters the first field is to hold. This program allows for a maximum of 50 characters. If the information you want to store is longer, you can divide the field into two or more pieces.

You will be asked to specify how many records you actually want.

ENTER A RECORD

When you have completed the procedure, the program will automatically take you back to the MAIN MENU. Now select option 2 to start entering your records.

At the top of the screen, the computer will keep a running tally of how many records you enter, along with the total space in the store. Under this line, the computer will display the field names.

Key in the details you want recorded under each field heading. Keep them as short as possible and within the maximum character length you have set. Press the ENTER or RETURN key, and the information you have keyed in will be printed out next to the field name. The bottom of the screen will clear, ready for you to key in the next

piece of information.

The computer star
the top of the scree
down the screen e
information and press

VIEW RECOR

Option 3 enables y
records you have en
display the first recor
first one according t
selection method. Co
arranging alphabetic
But broadly, they s
alphabetical order by
than one record has
orders them by the s
by the third and so
problems.

The first arises wh
in the first field. The
any number before
through the same orc
digit, when decidin
rather than looking
whole. In other word
with the first fields,
from 1 to 100, the con
10, 11, 12, 13, 14, 15, 16
got around to 2, 20, 21

The way round t
records 001, 002, ..01
better still, avoid usin
first field.

The second proble
mixture of capital ar
because the compu
ahead of lower cas
ahead of 'Aaron'. Y
convenient to list eve

When viewing the
displayed near the
F(orward) B(ack) M(
and the computer
record: press F repe
through the whole f
The B key takes yo
the records, so you c
forwards through the
keys.

Pressing M will re
MENU at any point.

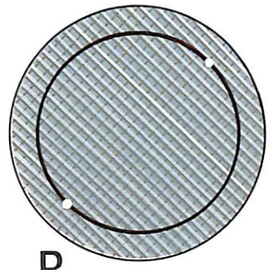
SEARCH OPT

This option allows y
any of the fields for
particular piece of inf

Press the 4 key, a
ask you which field y
in the number of the
for the second, 3 fo
counting from the to
then ask you what y
field for, so key in t
should look for in th
EVEREST, or APOLL
then press RETURN c

The word or numb

DIVE BOMBER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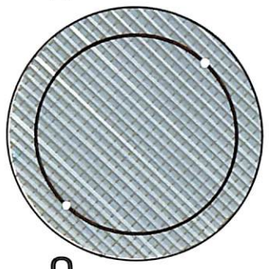
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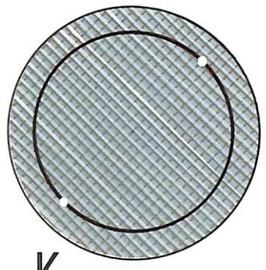
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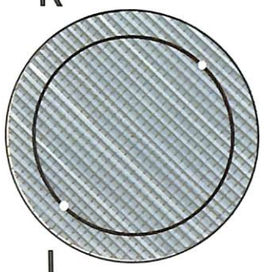
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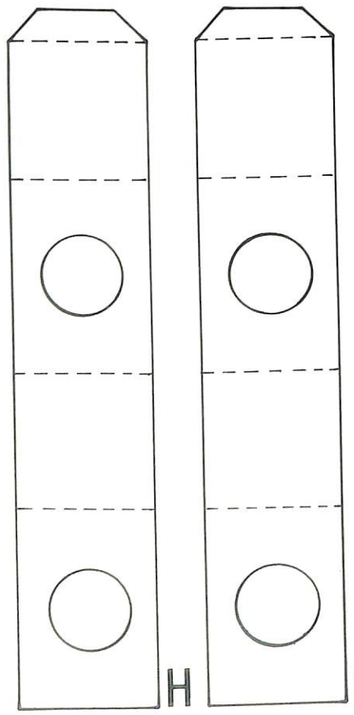
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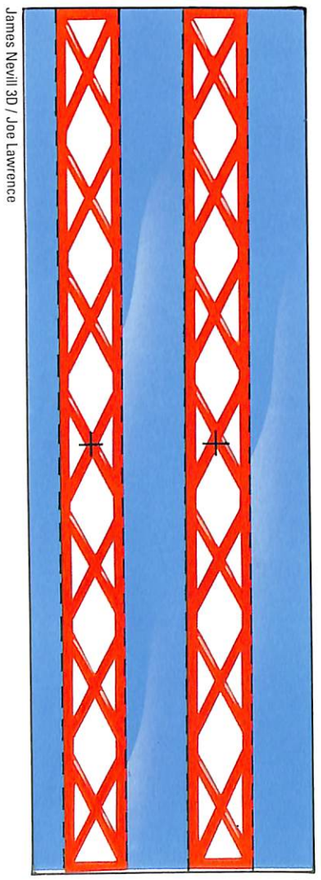
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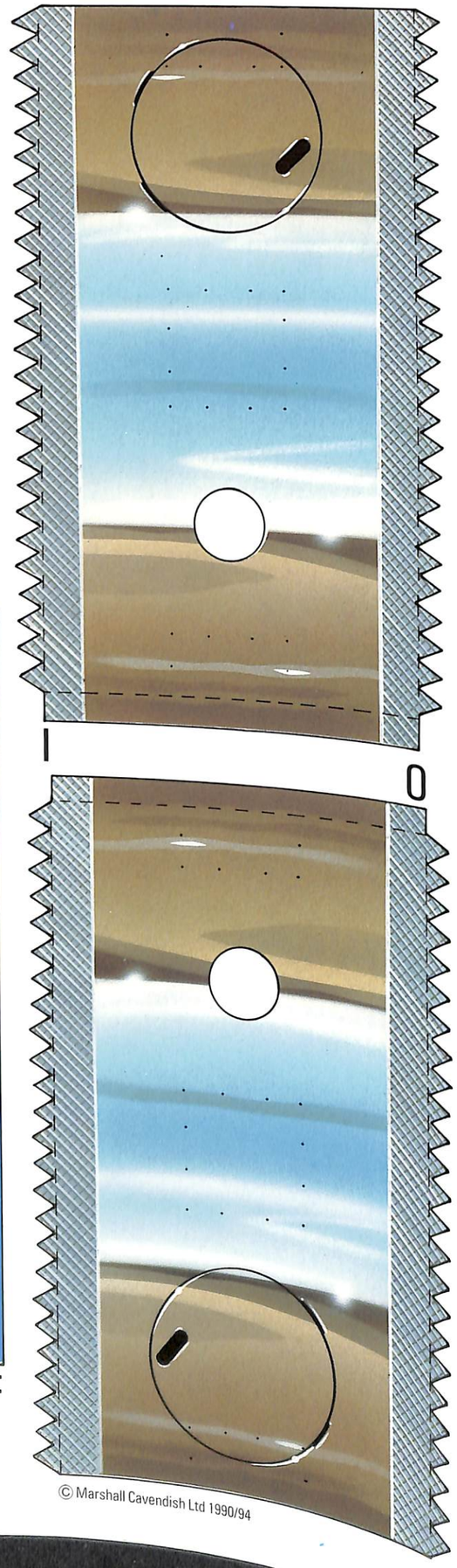
James Nevill 3D / Joe Lawrence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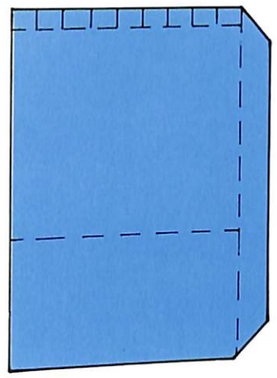
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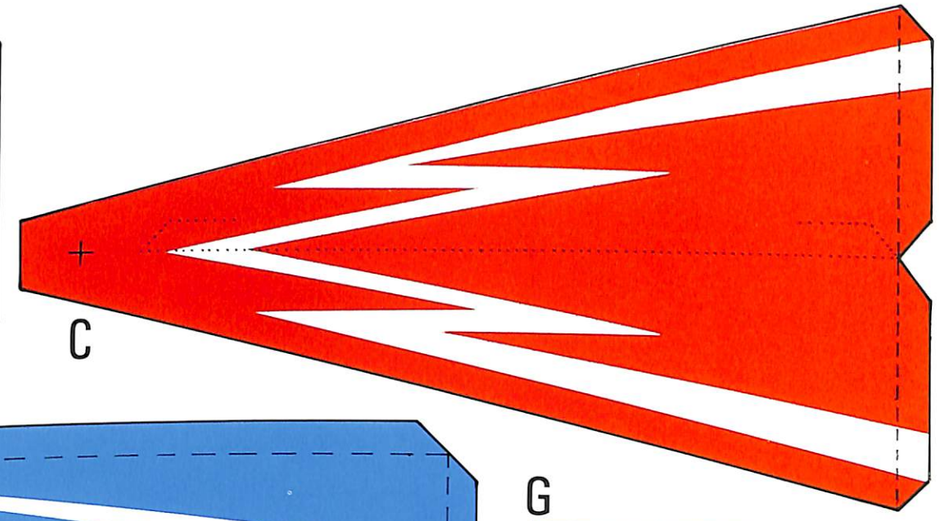
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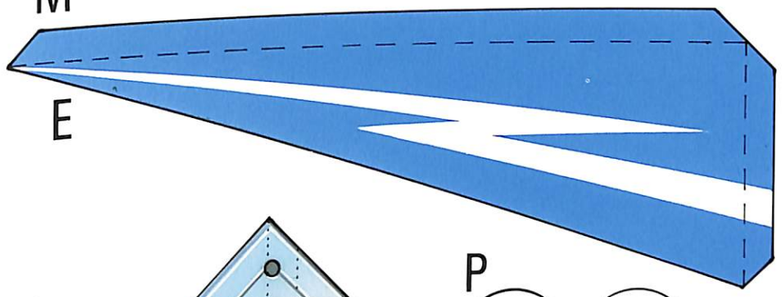
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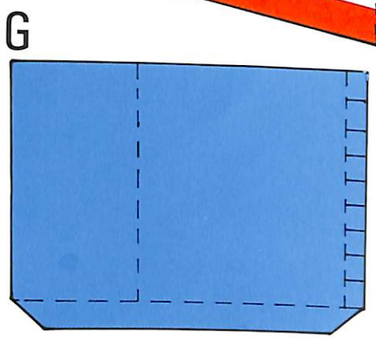
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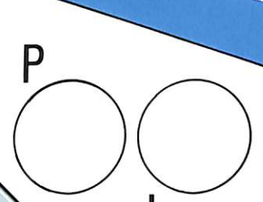
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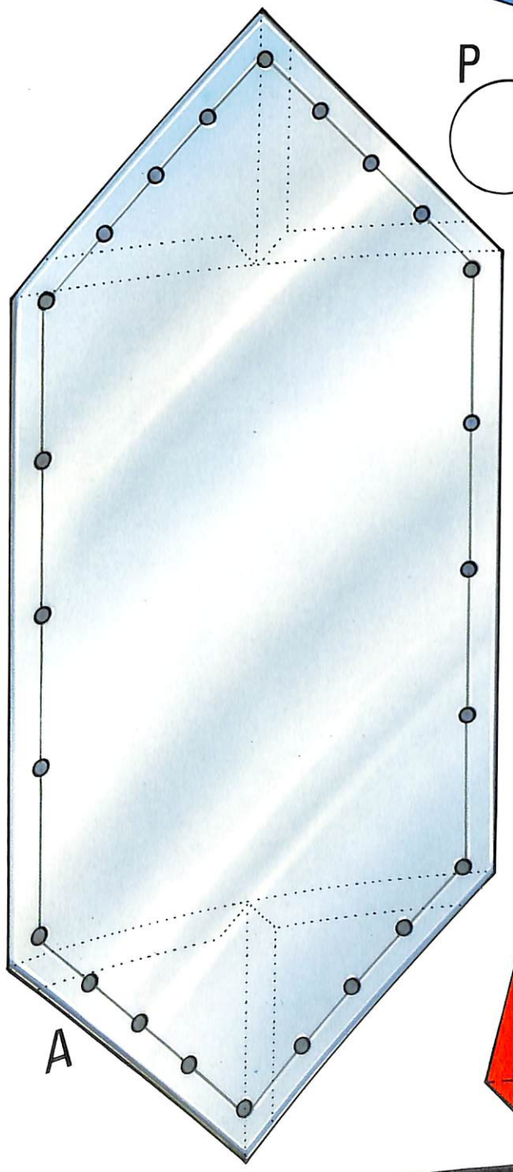
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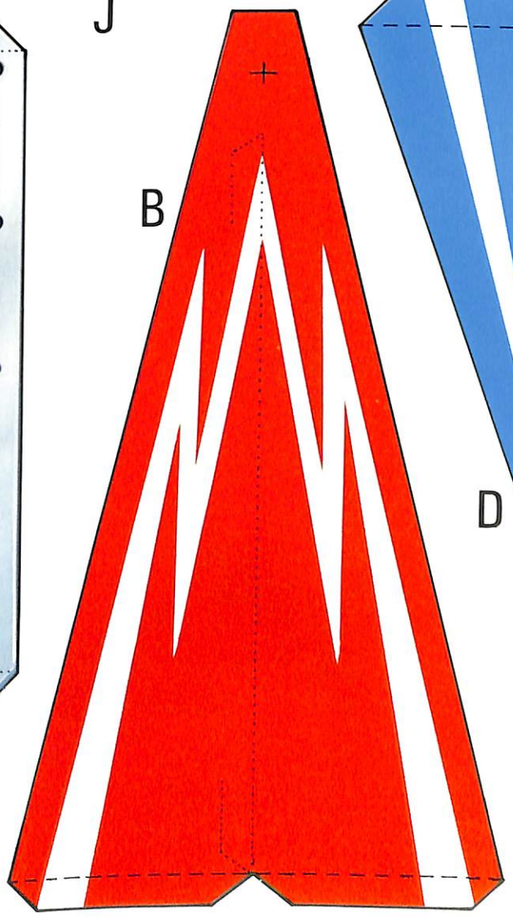
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